



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: )  
Michael A. Rothman et al. )  
Application No.: 10/775,863 )  
Docket No.: P18513 )  
Filed: 02/09/04 )  
For: *METHOD AND APPARATUS FOR*  
*ENABLING PLATFORM CONFIGURATION* )  
\_\_\_\_\_  
)

Examiner: Anand B. Patel

Art Unit: 2116

Phone No.: (571) 272-7211

Commissioner For Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R. §1.131**

We, Michael A. Rothman and Vincent J. Zimmer, hereby declare the following:

1. We are the inventors of the above-captioned patent application and the subject matter described and claimed therein.
2. Intel Corporation (Intel) is the assignee of the present invention.
3. Regarding the date of invention, prior to October 29, 2003 (hereinafter "the Reference Date"), we conceived the invention described and claimed in the above-captioned patent application (hereinafter "the present invention"), as shown by the Exhibit attached to this declaration. The Exhibit is an invention disclosure form (IDF) submitted by us before October 29, 2003. Although the dates on the Exhibit have been redacted, each of the redacted dates on the Exhibit is prior to the Reference Date. Other unnecessary matter has also been redacted from the Exhibit.
4. Soon thereafter, the IDF was diligently submitted to an intellectual property committee of Intel for review. Soon thereafter, the invention disclosure form was reviewed by the committee, and the committee decided to file a patent application covering the present invention. Soon thereafter, a patent

attorney was diligently contacted by the committee and was tasked with preparing the present application. Soon thereafter, an initial draft of the present application was prepared by the patent attorney and forwarded to us for review. After at least one iteration of diligent review by us and diligent revision by the patent attorney, incorporating our comments, a final draft of the present application was provided to us for our signatures. Soon thereafter, the present application was diligently filed. All of this work was completed in the six months preceding the filing date of February 9, 2004.

We hereby declare that all statements herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made knowing that willful false statements and the like are punishable by fine or imprisonment, or both under § 1001 of Title 18 of United States Code, and such willful or false statements may jeopardize the validity of the above-identified application or any patent issuing therefrom.

Respectfully submitted,



Michael A. Rothman

Date: 7/31, 2006

Date: \_\_\_\_\_, 2006



Vincent J. Zimmer



10/775,863

: 503 2649227

# 1 / 2

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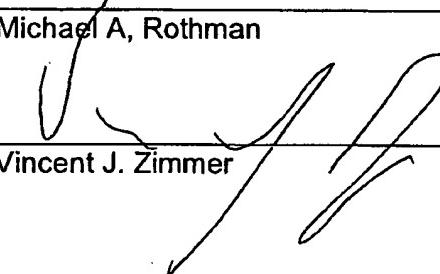
Respectfully submitted,

Date: \_\_\_\_\_, 2006

Date: 8/15, 2006

\_\_\_\_\_  
Michael A. Rothman

\_\_\_\_\_  
Vincent J. Zimmer





**INTEL INVENTION DISCLOSURE**  
**ATTORNEY-CLIENT PRIVILEGED COMMUNICATION**  
located at <http://legal.intel.com/patent/idf.asp>  
Rev. 20 – September 2003

34565

DATE:

SOFTWARE/EPG/SSG/CSD

It is important to provide accurate and detailed information on this form. The information will be used to evaluate your invention for possible filing as a patent application. **Invention Disclosure forms MUST be sent electronically via email to your manager/supervisor who should then forward with their approval to our email account "invention disclosure submission."** See [http://legal.intel.com/patent/idf\\_instructions.asp](http://legal.intel.com/patent/idf_instructions.asp)  
If you have any questions, please call 8-264-0444.

Last Name: Rothman	First Name: Michael	M.I. A
Intel Phone Number: 253-371-8052	Intel Fax Number: 253-371-2422	Mailstop: DP2-420
E-mail address: Michael.A.Rothman@intel.com		WWID: 10648567
Citizenship: US	Are you a contractor? Yes:	No: X
Home Address: 11905 183 <sup>rd</sup> Street East		
City: Puyallup	State: WA	Zip: 98374
Corporate Level Group: IAG	Division: SSG	Subdivision: CSE
Supervisor: Leora Gregory	WWID: 10055263	M/S: JF1-235
Phone #:	503-264-8855	

Last Name: Zimmer	First Name: Vincent	M.I. J
Intel Phone Number: 253-371-5667	Intel Fax Number: 253-371-2422	Mailstop: DP2-420
E-mail address: Vincent.zimmer@intel.com		WWID: 10542335
Citizenship: US	Are you a contractor? Yes:	No: X
Home Address: 1937 South 369 <sup>th</sup> Street		
City: Federal Way	State: WA	Zip: 98003
Corporate Level Group: IAG	Division: SSG	Subdivision: CSE
Supervisor: Leora Gregory	WWID: 10055263	M/S: JF1-235
Phone #:	503-264-8855	

**(PROVIDE SAME INFORMATION AS ABOVE FOR EACH ADDITIONAL INVENTOR)**

2. Title of Invention:

Method to enable platform configuration

3. What technology/product/process (code name) does your invention relate to (be specific if you can):

SMM, Firmware, EFI, Configuration

4. Include several key words to describe the technology area of the invention in addition to # 3 above:

Platform Configuration, BIOS, SMM, SMI

5. Stage of development (i.e. % complete, simulations done, test chips if any, etc.):

50%

6a. Has a description of your invention been (or planned to be) published outside of Intel:

No

If YES, was the manuscript submitted for pre-publication approval through the Author Incentive Program:

If YES, please identify the publication and the date published:

6B. HAS YOUR INVENTION BEEN USED/SOLD OR PLANNED TO BE USED/SOLD BY INTEL OR OTHERS?

YES

IF YES, DATE IT WAS SOLD OR WILL BE SOLD:

Q3 '04

6c. Is a SIG (special interest group) active in this technology?

No

If YES, name of SIG:

6d: If the invention is embodied in a semiconductor device, what is the actual or anticipated date of tapeout?  
No

6e. If the invention is software, actual or anticipated date of any beta tests or other distribution outside Intel:  
Q3 '04

7. Was the invention conceived or constructed in collaboration with anyone other than an Intel blue badge employee or in performance of a project involving entities other than Intel (e.g. government, other companies, universities or consortia)?

8. Is this invention related to any other invention disclosure that you have recently submitted? If so, please give the title and inventors: No

9. (Optional) Which IP Committee do you think should review your invention disclosure based on the descriptions provided in the linked document? Software

**PLEASE READ AND FOLLOW THE DIRECTIONS ON  
HOW TO WRITE A DESCRIPTION OF YOUR INVENTION**

**Try to limit your description to 2-3 pages contained WITHIN THIS WORD DOCUMENT  
Do NOT attach separate diagrams, presentations, white papers, or specifications  
Do NOT embed other types of documents into this document**

**ANSWER ALL OF THE QUESTIONS BELOW**

**Please provide a description of the invention and include the following information:**

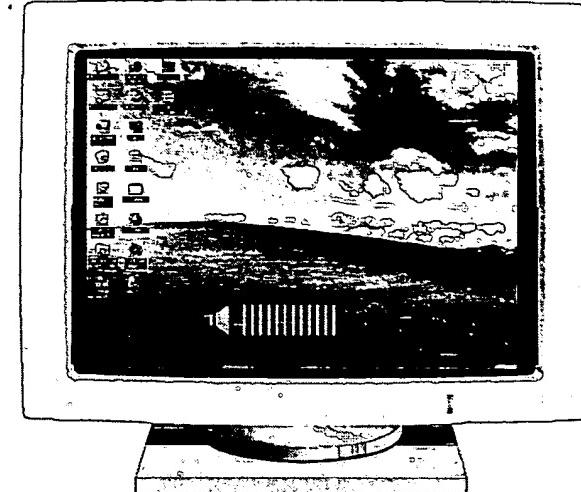
**1. Describe in detail what the components of the invention are and how the invention works.**

This invention provides a means by which one can initiate a platform-based setup any time during system evolution without perturbing the surrounding environment. The problem that this addresses is that today there is only a finite time where one might be able to run the traditional BIOS setup of a platform. To further elaborate on the brevity of the window where one might run the traditional BIOS setup, during the boot process, one is allowed only 7 seconds from power-on to executing the loader of the operating system. This dictum is from the Microsoft Windows Logo program guidelines

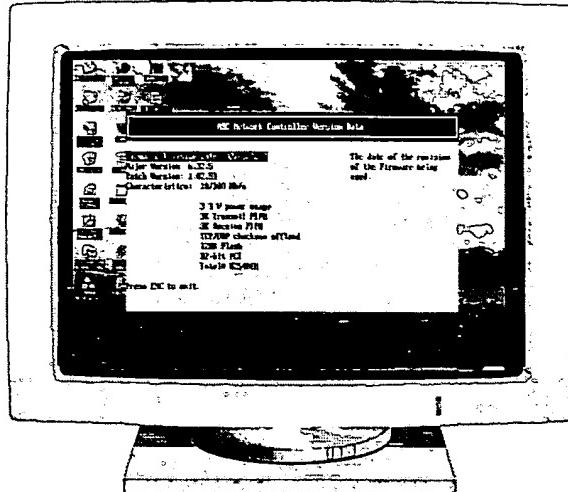
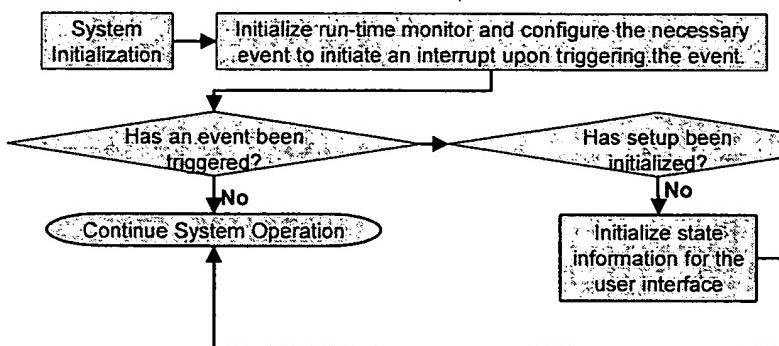
<http://download.microsoft.com/download/whistler/HWL/2.0/WXP/EN-US/hwlogov1-1.exe> Since most systems spend more than 99% of their power-on time in the operating system, the platform setup would typically not be available to be executed. This invention provides an ability to have an event trigger a system management interrupt (SMI) to enable the reconstitution of a primitive firmware environment and allow for the execution of the pre-boot setup application any time during the system operation.

To avoid interoperability issues with the operating system, one has to ensure that SMM context is not active for >100us. For purposes of overhead, the entry and exit of the SMM context has an overhead of roughly 150ns on a 2.4Ghz Northwood processor. As the state diagrams below will show, we ensure that the SMM context is such that we can interleave and receive event such that the user's visual perception is of a seamlessly integrated platform setup, but in reality one would be entering and exiting the SMM context to achieve this seamlessness. During the user's interaction with the firmware setup, the firmware will proxy configuration requests and post them to the appropriate non-volatile store (e.g. NVRAM, CMOS, etc). Additionally, the logic in the firmware would stop the interleaving the O/S and SMM context if no input was received in the SMM context within an allotted time. Also, once the firmware's setup was initialized, the necessary state information would be maintained so that upon entry to the setup, the user would perceive they had left off where they previously had been.

The means by which we can deploy this model are as follows:



Present Art which Does INT10 through SMI  
to achieve fairly primitive functionality.  
(example from Volume control button on a ThinkPad)



This art describes an event that can be initiated so that an out-of-band version of a firmware-based platform setup can be executed so platform configuration can take place any time during the system evolution.

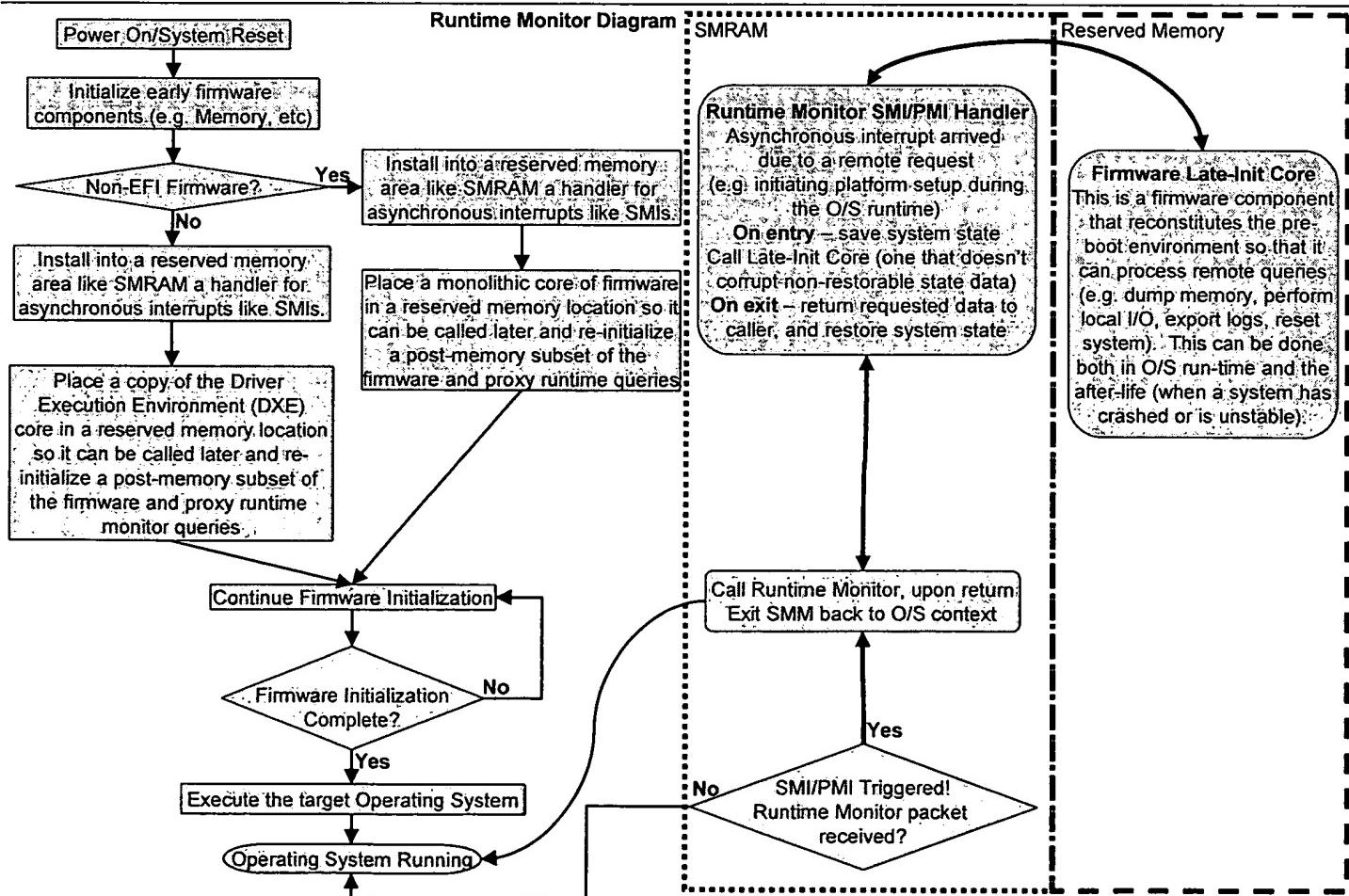
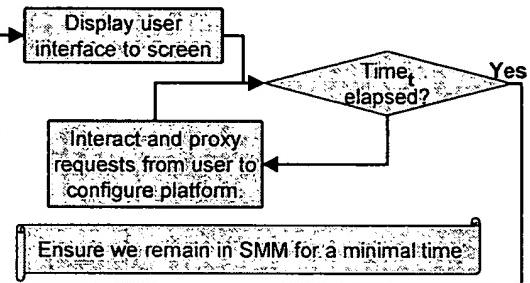


Figure 1

**2. Describe advantage(s) of your invention over what is currently being done.**

Advantages include:

- This invention provides a means by which the platform configuration utility can be launched regardless of the system's operational phase.
- By enabling a seamless integration of the platform setup application, one is not required to "catch" the right window in time to initialize the platform configuration application.
- Today, SMI code only manages primitive, trivial user-interface artifacts, like the volume control. The present firmware infrastructure is not sophisticated enough to support the fully enabled setup/browser from SMM. This art goes above-and-beyond ANYTHING AT ALL available today.

**3. You MUST include at least one figure illustrating the invention. If the invention relates to software, include a flowchart or pseudo-code representation of the algorithm.**

See section 1

**4. Value of your invention to Intel (how will it be used by Intel or a competitor).**

Value to Intel includes:

- By providing the ability to configure the platform at any time, this provides a rather significant capability which is otherwise limited to the phase of operation that the computer is almost assuredly not in. (Platforms are only in the pre-boot phase for <7 seconds.)

**5. Explain how your invention is novel. If the technology itself is not new, explain what makes it different.**

Novelty includes:

- This is the first time that platform configuration can be seamlessly integrated into the system without perturbing the surrounding environment.

**6. Identify the closest or most pertinent prior art that you are aware of.**

None.

**7. Who is likely to want to use this invention or infringe the patent if one is obtained?**

The parties likely to infringe on this art are any company that typically would sell system solutions that would like to leverage the novel aspects of this invention. This could be enterprise-computing companies like DELL, IBM, HP, Sun, Bull, Unisys, EMC, Cisco, etc.

**8. How would infringement be detected?**

One could easily determine if infringement is occurring by observing the mechanisms that are being used for interaction and configuration of the machines. Attachment of an In-Target Probe (ITP) would allow for examination of binary executable code and detection of infringement of this algorithm. The tracing of the algorithms used for resource allocation interfaces would easily determine violations.

**HAVE YOUR MANAGER/SUPERVISOR READ AND FORWARD THIS DISCLOSURE ELECTRONICALLY  
VIA E-MAIL TO "INVENTION DISCLOSURE SUBMISSION"**

**BY APPROVING, YOUR MANAGER/SUPERVISOR IS ACKNOWLEDGING THAT THE DISCLOSURE HAS  
BEEN READ AND UNDERSTOOD, AND RECOMMENDS THAT THE DISCLOSURE AWARD BE PAID**